A careful consideration of the details of the expenditure has led the Committee to the conclusion that in order to enable Mr. Moore to successfully lead another expedition for two seasons, and to accomplish the above-stated objects, a sum of not less than 5000*l.* will be required. The Committee have already received encouraging offers of support, including one of 1000*l.* from a gentleman connected with the commercial and political interests of British Africa. They point out, however, that the results to be obtained will increase almost in the ratio of the square of the initial expenditure; and in a private circular, which has been issued, the members of the Committee appeal to those who feel interest in the objects of the expedition, for assistance in carrying out an enterprise which is not only of the highest scientific importance, but is also of great significance in securing British influence in a critical region of the African interior.

UNIVERSITY COLLEGE AND THE UNIVERSITY OF LONDON.

We are glad to be able to publish the following text of a resolution adopted by the Council of University College, London, at their session on December 10. The offer contained in the resolution is a noble one; and we hope that the example afforded by it will be followed by other similar institutions, in order that the labour of the Statutory Commission may be simplified.

That a Deputation be appointed to represent to the Statutory Commission that—inasmuch as

(1) University College, London, was founded as the University of London, with the object of providing a complete University education in London of the highest type.

(2) The intention of the founders and benefactors of University College will only be carried out by the incorporation of the College in the University, so that its resources shall still be utilised for the furtherance of the highest educational work and for research.

The Council are prepared to summon a general meeting of the members of the College, and to propose to them that such steps should be taken as may be necessary for placing the site, land, buildings and endowments of the College at the complete disposal of the reconstituted University.

In making this offer the Council do not desire to throw any obstacle in the way of any other institutions in London which may be disposed to place their resources at the disposal of the Governing Body of the University.

It will be necessary in accordance with the precedent afforded by the Universities Act (Oxford and Cambridge) to protect the interests of the existing teachers and executive staff of the College. The existing teachers are, however, to have no claim as such to any rank in the re-constituted University, or to any vested interest other than that they now have in the College.

Special provision will probably have to be made as to the boys' school and its endowments, and perhaps for appropriate buildings on another site being provided for this department of the College work. Arrangements will also have to be made with regard to the Hospital and its funds, of which the College is now the Trustee.

(Signed on behalf of the Council),
J. Gregory Foster,
Acting-Secretary.

NOTES.

Prof. Marsh has been elected a correspondant of the Section of Mineralogy of the Paris Academy of Sciences, in succession to the late Prof. James Hall.

The Geographical Society of Berlin (Gesellschaft für Erdkunde zu Berlin) have sent out a circular inviting the friends and promoters of geography in all countries, and especially the members of geographical societies and cognate scientific bodies, to be present at the seventh International Geographical Congress, to be held in the German capital from Thursday, September 28, to Wednesday, October 4, 1899. Before the beginning and after the close of the Congress, excursions will be arranged through such parts of Germany as are of interest from the points of view of physical or economic geography. The subjects which are to be discussed at the Congress will be arranged in the following groups: (1) mathematical geography, geodesy, cartography, geophysics; (2) physical geography (geomorphology, oceanology, climatology); (3) biological geography; (4) industrial and commercial geography; (5) ethnology; (6) topical geography, exploring travels; (7) history of geography and of cartography; (8) methodology, school geography, bibliography, orthography of geographical names. According to the usual custom, the English, French, German, and Italian languages will be admitted as languages of the Congress, and all papers must be written in one of them. The latest date for receiving papers is June 1, 1899; and the subjects should be notified by April 1, 1899. All correspondence relating to the Congress should be addressed to the VII. International Geographical Congress, 90 Zimmerstrasse, Berlin, S.W.

Dr. Capitan has been elected president of the Paris Anthropological Society for 1899.

The Desmazières prize has been awarded by the Paris Academy of Sciences to Dr. J. B. de Toni for his "Sylloge Algarum."

The Paris correspondent of the *Chemist and Druggist* states that a "Retrospective Museum of the History of Chemistry" is being organised to figure in the Paris Exhibition of 1900. It will comprise objects relative to scientific discoveries and industrial improvements—in fact, everything that can clearly show the successive progress accomplished in the chemical industry and the importance of the discoveries made by French savants. Amongst the objects indicated as admissible are laboratory apparatus, reports on discoveries, portraits of inventors, investigators, and manufacturers, descriptions of processes, products obtained by inventors or in scientific laboratories, drawings, plans, models in relief, &c. Industrial museums, faculties, schools, manufacturers, and private individuals are invited to send a list of articles they may be willing to lend.

A prize of 1000 marks is offered by the Economic Society of Mohrungen, near Königsberg, for the best work on the relations of electricity to living organisms. The work must discuss either fundamentally new phenomena in plant or animal electricity, or, from the point of view of physics, discuss the sources of organic electricity, or its significance for life in general or for certain functions.

Very little is at present known of the flora of Porto Rico. This is not likely to remain long the case, since the attention of the Americans has been turned to the island. An American citizen, Mr. Cornelius Vanderbilt, has offered to bear the expense of a botanical expedition to the island by Mr. A. A. Heller, under the auspices of the New York Botanical Garden

An informal Committee will shortly meet in Calcutta to consider the reports by the Astronomer Royal and Sir Norman Lockyer, who were recently asked for advice regarding Indian astronomical and solar observatories. The future working of these observatories will be discussed, and Sir James Westland, Messrs. T. Holderness and J. Eliot, and General Strahan, Surveyor-General, will probably be members of the Committee.

It is announced that the Royal Academy of Medicine of Belgium has appointed a Commission to consider the following proposal:—"The Royal Academy of Medicine asks the Government to enter into negotiations with foreign Governments with a view to drawing up an International Pharmacopoeia."

A SHORT course of lectures adapted for a juvenile audience will be given at the Society of Arts on Wednesday evenings, January 4 and 11, 1899, at 7 o'clock, by Prof. F. Jeffrey Bell. The first lecture will be on "Hands and Feet," and the second lecture on "Some Ways in which Animals Breathe."

THE following are among the Lecture Arrangements at the Royal Institution before Easter:—Sir Robert Ball, six lectures (adapted to young people) on astronomy; Prof. E. Ray Lankester, ten lectures on the morphology of the mollusca; Mr. A. Henry Savage Landor, three lectures on Tibet and the Tibetans; Dr. Allan Macfadyen, four lectures on toxins and antitoxins; the Right Hon. Lord Rayleigh, seven lectures on the mechanical properties of bodies. The Friday Evening Meetings will begin on January 20, when a discourse will be delivered by Prof. Dewar on liquid hydrogen; succeeding discourses will probably be given by the Right Hon. Sir Mountstuart E. Grant Duff, Mr. Victor Horsley, Prof. H. S. Hele-Shaw, Mr. Richard R. Holmes, Sir Frederick Pollock, Bart., Prof. H. L. Callendar, the Right Hon. Lord Rayleigh, and other gentlemen. The year 1899 is the centenary year of the Royal Institution, and arrangements are being made with a view to its celebration in a fitting manner. Details will be announced at a later period.

REFERRING to next year's meeting of the British and French Associations, the Paris correspondent of the *Times* remarks:—Science, happily, has no politics, and the French Association for the Advancement of Science, with the view of fraternising with the British Association, has fixed its next congress for September 14 to 22 at Boulogne. The office-bearers of the two associations have agreed on a joint gathering at Dover during the two congresses. Although the younger association will thus cross the Channel to show its deference for seniority, it is understood that there will be a return visit. The French Association having thus, so to speak, broken the ice, it may be hoped that, just as it has already held a congress across the Spanish frontier, it will before long receive and accept an invitation from some English town. The distance can evidently be no objection, for it has held two congresses in Algeria and a third in Tunis.

SIR WILLIAM JENNER, G.C.B., F.R.S., Physician in Ordinary to the Queen and to the Prince of Wales, died on Sunday, at the age of eighty-three years. From a long obituary notice in the *Times*, we extract the following particulars of his career:—He was born in 1815, at Chatham, and was educated at University College. In 1844 he graduated as M.D. in the University of London; and in 1848 he was appointed professor of pathological anatomy to University College and assistant-physician to University College Hospital. In 1852 he was elected a Fellow of the Royal College of Physicians, and was appointed Gulstonian Lecturer. He then became physician to the Hospital for Sick Children, assistant-physician to the London Fever Hospital in 1853, and full physician to University College Hospital in 1854. In 1857 he succeeded to the professorship of clinical medicine in University College. In 1862 he was appointed Physician in Ordinary to Her Majesty, and professor of the principles and practice of medicine at University College. In the following year he was appointed Physician in Ordinary to the Prince of Wales, and in 1864 was elected a Fellow of the Royal Society. He was created a baronet in 1868, K.C.B. in January 1872, and G.C.B. in 1889. He was President of the Royal College of Physicians from 1881 to 1888, and had received honours from many learned bodies both in this country and abroad. He was a D.C.L. of Oxford, LL.D. of Cambridge and of Edinburgh, a Commander of the Order of Leopold of Belgium, and an honorary member of the Belgian Academy of Medicine. Jenner was not a voluminous writer. His chief works were on the "Identity or non-identity of typhus and typhoid fevers," and on "Diseases commonly confounded under the term continued fevers." He also published his Gulstonian Lectures on emphysema, and two or three volumes of clinical lectures on diphtheria, rickets, tuberculosis, and other subjects.

AFTER a long illness, Sir William Anderson, K.C.B., F.R.S., Director-General of Royal Ordnance Factories, died on Sunday last, December 11. He was born in St. Petersburg in 1835, and was educated at the High Commercial School there, where he was head of the school and silver medallist, and had conferred on him the Freedom of St. Petersburg. He was a pupil of Sir William Fairbairn, and a member of the firm of Messrs. Courtney and Stephens, engineers, of Dublin, from 1855 to 1864. He communicated a number of papers on engineering subjects to the Institute of Civil Engineers of Ireland, and was President of that Society in 1863. He received the Telford medal and the James Watt medal of the Institute of Civil Engineers. He was distinguished for the ability with which he applied his knowledge of the science of heat, and other cognate sciences, to the practical requirements of the engineer. The knowledge of Russian obtained in early life enabled him to translate the works of Chernoff on steel, and the researches of General Kalakontsky on the internal stresses in cast-iron and steel. He was elected a Fellow of the Royal Society in 1891; and was Vice-President of the Institution of Civil Engineers, a Past-President of the Institution of Mechanical Engineers, and hon. D.C.L. of Durham University. In 1889 he was appointed Director-General of the Royal Ordnance Factories, and last year he was created a K.C.B.

A MEMORIAL has been prepared for presentation to the Lord President of the Council (the Duke of Devonshire) and the President of the Board of Trade (Mr. Ritchie), protesting against the proposed removal and distribution of the collection of fish which was brought together by the late Mr. Frank Buckland, and has formed the Buckland Fish Museum in South Kensington Museum. With the view of rescuing the museum and increasing its usefulness, it is proposed that it should be made part of the duties of the inspectors of fisheries to preserve and deposit in the Museum of Economic Fish Culture any objects of permanent interest which may come under their notice, together with models of improvements in fish passes, fish culture apparatus, &c., which may be useful for reference or record. It is also suggested that the secretary and the inspectors of the Fisheries Department, together with the representatives of the Fishmongers' Company, should be appointed visitors to advise on and aid in the efficient management and development of the museum.

THE death of Dr. James I. Peck, assistant professor of biology in Williams College, and distinguished for his investigations in marine biology, is announced in *Science*. The following particulars are given, by Prof. H. C. Bumpas, of his contributions to biological knowledge:—In 1888 Dr. Peck prepared one of the first serious contributions to the study of variation that had been made since the time of Darwin. The summer of 1889 he spent at Woods Holl, where he worked upon the habits of the young of certain food fishes. In 1890 he published his Cymbuliopsis paper. In 1892 he was again a member of the scientific staff of the Fish Commission Laboratory, where he worked upon the Pteropods and Heteropods collected by the *Albatross*. The summer of 1893 was spent in preparing his paper on the "Food of the Menhaden," and in 1894 he continued his plankton studies and prepared a paper on the "Sources of Marine Food." In 1895 he was placed in charge of the Laboratory of the Fish Commission, and in 1896 he accepted the position of assistant director of the Marine Biological Laboratory.

THE *Chemist and Druggist* announces the death, at Grasse, of M. Jacques Passy, who attracted attention some time ago by his interesting researches on the chemistry of perfumes as regards their composition and physiological action. He was a chemist of promise, and one of the leading assistants of M. Alfred Binet, the director of the laboratory of psychological physiology at the Paris Sorbonne.

M. DE FONVIELLE writes:—"The success achieved on the night of November 13-14 by the astronomer Hansky in his balloon ascent, has induced M. Janssen to undertake further aerial experiments next year for the same purpose. At least two ascents are to take place from three different stations; one in Europe, one in America, and the last in Central Siberia. These ascents are to take place respectively and successively—three on the night of the 13-14, three on the night of the 14-15, at 2 o'clock a.m., local time, and to last to 7 o'clock. The aeronauts will be instructed to re-ascend on the following morning, viz. 14-15 for the first, and 15-16 for the second. The balloons are to measure from 50,000 to 60,000 cubic feet each in order to carry three men, one aeronaut and two observers, supplied with electric lamps, celestial maps, and chronometers. The balloon is to ascend to an altitude of 10,000 feet with registering thermo-baric hygrometer. Free balloons are to be sent up for testing the high atmosphere at an altitude of 10,000 feet."

A FINE series of stereoscopic diagrams of the catenaries on a rotating sphere, a paraboloid and a cone, as well as of geodesic curves on oblate and prolate spheroids, accompanies Prof. A. G. Greenhill's paper in the *Proceedings* of the London Mathematical Society, xxix. pp. 585-670, on "The Catenary and the Associated Trajectory on the Paraboloid and Cone." In the paper itself, the equations and properties of the curves represented are worked out by means of elliptic functions, and we understand that the illustrations are due in great part to the co-operation of Mr. T. I. Dewar. In order to make the curves stand out in better relief, they are mostly drawn on a background ruled to resemble a tesselated pavement.

THE thermodynamics of equilibrium in systems of two and three components having one liquid phase, forms the subject of an interesting paper by Dr. Giuseppe Bruni in the *Atti dei Lincei* for October (vii. 8), in which the author derives the following conclusion:—If to a system of two components with only one possible liquid phase there be added a third component which does not combine with the first two and is not isomorphous with them, the curves expressing equilibrium of the same order (curves of saturation in binary systems and cryohydratic curves in ternary systems) are parallel. Only in systems represented by the curve of the ternary mixture, the third added component exists mostly in the solid phase.

SINCE Lord Kelvin published in 1856 the details of the phenomenon known as the Thomson effect, few experimenters have turned their attention to experiments of a quantitative character, Batelli's investigations being almost the only exception. An absolute measurement of the Thomson effect in copper is described by Mr. R. O. King in the *Proceedings* of the American Academy of Arts and Sciences (xxxiii. 19). As Batelli did not experiment with copper, no direct comparison with his results can be made, but his value obtained for iron is about twice as great as Mr. King's present value for copper. According to Tait's assumption the value should be about five times as great.

ATTENTION seems to have first been called to the errors in localising sounds by E. Weber. The particular problems involved seem to be two, namely, the perception of the direction from which a sound comes and the perception of its distance. An attempt to contribute data towards the solution of these two problems has been made by Matataro Matsumoto, of the Tokyo Imperial University, and his researches on acoustic space appear in vol. v. of the *Studies* from the Yale Psychological Laboratory. The author considers that an acoustic sensation receives its spatial form primarily from the space-idea which is given to us by the visual, tactile and motor sensations. Acoustic space presupposes the existence of the space-form of other sensations. We have only to give an account of how the perception of the position of sounds arises on the basis of the already existing space which was given to us by other senses; as to the further problem of the ultimate origin of the space-form of perception, its solution must be sought in the visual and tactile perception.

THE late Mr. W. J. C. Miller, formerly Registrar of the General Medical Council, was perhaps best known in his capacity of mathematical editor of the *Educational Times*. But he also devoted many of his leisure moments to writing popular articles on natural history, many of which he contributed to the Selborne Society's *Nature Notes* and other journals. These papers are now to be published in a volume entitled "Nature Studies," under the editorship of Mr. H. Kirke Swann. The book should prove very agreeable reading, besides providing, for the many friends of Mr. Miller, a lasting memorial of the author.

A CONVENIENT method of preparing filamentous algae and fungi for the microscope is described by Mr. Charles J. Chamberlain in the *Journal of Applied Microscopy*. Mr. Chamberlain uses Flemming's weaker solution or chromo-acetic acid for fixing, followed by iron alum hæmatoxylin for staining, and mounts in glycerin concentrated by gradual evaporation from a ten per cent. solution. It would be interesting to learn, in applying the method to desmids, whether these can be prevented from their not unfrequently persistent tendency of floating to the surface and getting carried off in the repeated washings that are necessary.

DR. BRINTON has reissued a short article, contributed to the *American Anthropologist*, on "The Peoples of the Philippines." The two stocks which were found in possession of the islands at their discovery by Magallanes in 1521 were the small black Negritos, now reduced to about 10,000 persons, and the brown Malayan peoples, who are in the vast majority. As Dr. Brinton says: "The ethnic and historic relations of these two races offer some interesting problems in anthropology"; and it is not too much to hope, now that America has obtained the sovereignty of the islands, that these problems will be investigated and the results published for the benefit of science. It is painful to be reminded of the absolute neglect of these important matters by the British Government, who, with better opportunities than is possible in any other country, do less than is done by most of the European Governments; while the English student turns naturally with hope to the American Government. Dr. Brinton inclines to the theory, in which we think he is correct, that these two races of the Philippines are ethnographically distinct. The Negritos, so called, are extremely rude, owning no fixed habitations, not tilling the soil, making no pottery, and possessing no clothing except a girdle. Among their beliefs is that when one of their own people dies it is due to the black art of their Malayan foes, and they kill a Malayan if they can. This has given rise to a curious and significant relationship between the conquerors and conquered, which Dr. Brinton does not mention by the way; and we think there is a good field for observation here in a matter not always accessible to the inquirer, but which is, nevertheless, of the greatest importance. Of course, Dr. Brinton's note is only a summary of the present knowledge, but it is welcome.

IN *Das Wetter* for November, Dr. W. Meinhardus, of Berlin, discusses a fall of ice or frozen rain which occurred over a large part of the central and eastern parts of Germany on October 20. This phenomenon, which is sometimes called glazed frost, is one of the most peculiar and rarest forms of precipitation, which covers all bodies upon which it falls with a more or less thick layer of ice. From the reports received at the Berlin Meteorological Office, it appears that the frozen rain occurred with extraordinary violence in several localities. At Potsdam, Dr. Süring calculated that a blade of grass bore eight hundred times its own weight of ice. The ice-coating lasted through the whole of the day, and only disappeared with the setting in of a warm westerly current on the following morning. The occurrence of glazed frost is usually explained by the rain falling upon bodies below the freezing point, but no frosty weather had preceded the fall in this case. The conditions that produced it appear to have been (1) a layer of air in the upper regions, with a temperature above the freezing point; (2) this upper layer must have been moist, and have had a tendency to move upwards, so that condensation and rain-formation occurred; and (3) below this layer there must have been another stratum with a temperature below the freezing point. This inversion of temperature conditions is borne out by observations received from several of the mountain stations.

A PAPER on the ventilation of tunnels and buildings was read at the Institution of Civil Engineers, on December 6, by Mr. Francis Fox. In regard to the first part of the subject, Mr. Fox enunciated the proposition that if the amount of carbon dioxide in the air of a railway tunnel did not exceed 20 parts in 10,000, then the ventilation might be deemed satisfactory. The case of the Metropolitan Railway tunnels, having been the result of recent investigation, was not mentioned otherwise than to recall the fact that the amount of carbon dioxide in the air had been shown to be as much as 86 parts per 10,000. The great Alpine tunnels were next referred to. In the case of that under Mont Cenis, 8½ miles long and 26 feet wide, the higher altitude of the middle of the tunnel above its entrances was inimical to good ventilation, and at times great difficulty was experienced in carrying on the traffic. The St. Gothard Tunnel, 9¼ miles in length and 26 feet wide, was nearly level from end to end and, until recently, natural ventilation only sufficed, but, owing to increase of the traffic and the use of briquette fuel, the Saccardo system had lately been introduced. This consisted in blowing into the mouth of the tunnel a large volume of air which, on the principle of the injector, caused an induced current in the annular space between the interior surface of the tunnel and the gauge of maximum construction. In the second part of the paper Mr. Fox referred to the statement by Dr. Ransome, F.R.S., that 70,000 deaths occurred annually in Great Britain from tuberculous disease, nearly all of which could be saved were the subject of fresh air both understood and acted upon by the community. Competent medical authority considered that the quantity of carbon dioxide in the air of rooms should not exceed 10 parts per 10,000, equivalent to about 16 cubic feet per head per minute. In French hospitals 50 cubic feet per patient per minute was allowed. Mr. Fox considered that 20 cubic feet per minute would be sufficient for ordinary purposes. Tables were given of the impurity in the air of schools, with different systems of ventilation, of that in dwelling-houses, and of that in sewers; from which it appeared that the latter was the least impure of the three.

PROF. W. F. GANONG, of Smith College, Northampton, Mass., U.S.A., is desirous of obtaining accurately determined seeds of Cactaceæ for studies on the embryology of the order. His investigations on this subject are being published in the *Botanical Gazette*.

DR. N. WILLE has been appointed curator of the Museum and Herbarium of the University of Christiania, in succession to the late Prof. Blytt; and Dr. Carl Fritsch has been elected to succeed Kerner v. Marilaun as director of the Botanical Museum at Vienna.

LORD LISTER'S recent remarks upon the humanity of vivisection, reported in NATURE of October 20, have induced the Hon. Stephen Coleridge to gather a few extracts from the medical journals and the *Journal of Physiology*, and present them as evidence of "prolonged and terrible tortures." This he does in the hope that Lord Lister will "*do himself* the justice to confess that his statement at Liverpool was inaccurate"!

THE English equivalent of the German word "Anlage" is still a matter of discussion among biologists. Among the words favoured by various writers are forecast, fundament, rudiment, beginning, origin, and foundation. Dr. Arthur Willey recently suggested in these columns (August 25, p. 390) the word primordium as an accurate and well-sounding rendering of Anlage. Prof. Burt G. Wilder expresses a favourable opinion upon this word in *Science*, but thinks the shorter word proton, already familiar in numerous compounds, and used by many biologists, is a better equivalent.

DR. AMICO BIGNAMI, lecturer in the Institute of Pathological Anatomy of the Royal University of Rome, discusses in the *Lancet* the inoculation theory of malarial infection, and gives an account of a successful experiment with mosquitoes. He remarks at the end of this week's contribution: "To sum up, malaria is a disease which is contracted by inoculation—a fact of which we have now obtained the first experimental proof, since we have seen that an individual who has never had malarial fever by sleeping in a healthy place where no one had ever previously taken fever may sicken with malaria of a grave type if bitten by certain species of the mosquito brought in the adult state from some distant locality of highly malarious character. Further, everything points to the conclusion that inoculation is the only mode by which infection is acquired, since air and water as carriers of infection may be excluded, and because arguments based on analogy all tend in the same direction. This much at any rate we can assert—namely, that inoculation is the only mechanism of infection which has been demonstrated experimentally."

AN elaborate illustrated catalogue of apparatus used in physical and chemical laboratories and lecture rooms, and for bacteriological and microscopical work, has been issued by Messrs. W. and J. George, Ltd., the successors of the firm of Messrs. F. E. Becker and Co. The catalogue runs into no less than 662 pages, is printed on good paper, and profusely illustrated with pictures (many of them new) of instruments and accessories. Special attention appears to have been given to the arrangement of the contents, the description and price of each piece of apparatus being immediately adjacent to the illustration of the apparatus. The overcrowded appearance of many catalogues of scientific apparatus is thus avoided, and all particulars with regard to any instrument are readily found. The catalogue should be seen by teachers and investigators of all branches of experimental science.

IN a recent number of the *Journal für praktische Chemie* is an interesting contribution by Prof. Curtius and Dr. Rissom to the chemistry of azoimide and its metallic derivatives. Some losses having been noticed during the preparation of azoimide, by distilling a metallic salt with acid, it was found that heating in contact with dilute mineral acids caused notable decomposition of the hydrazoic acid. A large number of metallic salts were prepared and analysed, and in every case the salts were found to be anhydrous. The metallic derivatives differ considerably in their explosive properties. Thus, of the derivatives containing the metals of the alkalis and alkaline earths (with thallium), lithium nitride is the only one exploding violently on heating, and thallium nitride the only one detonating when struck on an anvil. The action of heat upon the nitrides of these two groups is very remarkable, as when small quantities of the nitride are heated carefully in thin glass tubes, decomposition takes place quietly, nitrogen being evolved, and the pure metal left behind; this being, as the authors point out, much the easiest method of preparing small quantities of barium, strontium, and calcium.

THE additions to the Zoological Society's Gardens during the past week include an Egyptian Jerboa (*Dipus aegyptius*) from North Africa, presented by Miss Da Costa; an African Buzzard (*Buteo desertorum*), an Iceland Falcon (*Hierofalco islandus*), captured in the Red Sea, presented by Captain E. W. Burnett; a Peregrine Falcon (*Falco peregrinus*), captured in the Red Sea, presented by Captain Bear; a Rough-keeled Snake (*Dasypeltis scabra*) from South Africa, presented by Mr. H. Oakley; two Scops Owls (*Scops giu*), South European, deposited; a Brazilian Tapir (*Tapirus americanus*, ♀) from the Upper Amazons, two Common Rattlesnakes (*Crotalus durissus*) from North America, purchased; an Axis Deer (*Cervus axis*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

THE GEMINIDS.—For the greater part of the evenings of the 10th, 11th and 12th of this month, clouds prevented observations of the Geminids in London. Late on the night of the 12th, however, when the sky became to some extent clear, a brief watch of an hour, from 11h. 30m. p.m. to 12h. 30m. a.m. G.M.T., disclosed the fact that these meteors were very much *en evidence*. Between 11h. 30m. and 12h. 5m. no less than twenty-four Geminids were observed, four of which were of great brilliancy and brighter than a first magnitude star. The direction of observation was necessarily restricted towards the north-west. Curiously enough, a further watch from that time until 12h. 30m. was only rewarded by the observation of one meteor, and that not a Geminid, which gave one the impression that the shower had terminated. Clouds prevented further observation. Whether the shower was more brilliant earlier in the evening cannot, so far as this place of observation is concerned, be stated. Another observer, Mr. W. E. Rolston, of the Royal College of Science, South Kensington, was also surprised at what appeared to be quite a shower of meteors on the same evening. He recorded the appearance of several meteors during the interval 11h. 15m. p.m. to 12h. 20m. a.m. G.M.T., one of which, as he describes, "an exceptionally long and bright one, leaving a long trail of reddish sparks, which lasted for about two seconds." The same observer also mapped nine true Geminids on the night of the 9th.

COMET CHASE.—Using the same elements as those we published in our last number, the following is the ephemeris for the current week.

Ephemeris for Berlin Mean Midnight.

1898.	R.A. (app.) h. m. s.	Decl (app.) ° ′	Br.
Dec. 14	10 47 51	+25 49·3	1·39
,, 16	49 51	26 6·0	
,, 18	51 44	26 23·4	
,, 20	53 31	26 41·3	
,, 22	10 55 11	+26 59·8	1·39

The comet is thus still in the constellation of Leo, and is situated approximately between 54 and 57 Leonis. It is now brighter than it was at the time of its discovery. Prof. E. Weiss thinks that it may be identical with 1867 I.

It is interesting to remark that the comet was discovered photographically near the radiant point of the Leonid meteor swarm. Four other photographs taken—two at the Yale, and two at the Harvard observatories—have corroborated its presence.

THE TOTAL SOLAR ECLIPSE OF JANUARY 22, 1898.—We have received from the Survey of India Department the report on the observations made at Dumraon, Pulgaon, and Sahdol during the recent solar eclipse. The report is divided into three sections, each section giving an account of the arrangements and observations made at the three different stations. The first, somewhat necessarily brief, is written by Mr. T. A. Pope, Assistant Surveyor-General, who had charge of a three-inch photographic doublet. With this instrument an excellent series of plates of the corona was obtained, one of which is reproduced as frontispiece to the present volume. The Pulgaon report, by Captain G. P. Lenox Conyngham, R.E., contains an interesting and well illustrated description of the camp, and the programme which the party had before them. Mr. Newall and Captain Hills, it will be remembered, occupied this station, and received valuable assistance from the officers and others present. The report on the observations at Sahdol, by Major S. G. Burrard, R.E., is somewhat more voluminous than the two preceding. In addition to a general account of the arrangements as regards the camp distribution and the preparatory work of the observers, such results as could be immediately deduced are given. Thus, for instance, we have a comparison between the temperature curves obtained on the actual and following day of the eclipse, showing clearly the drop from the time of first contact to about half an hour after totality, and the subsequent rapid rise. The large assembly at Sahdol made it possible to organise a party to make sketches of the corona. This was done, with the result that we have here thirty-one facsimiles of the hand-drawings made. After an examination of these sketches, we can truthfully remark, with Major Burrard, that "the accordance between these drawings is more remarkable than their discrepancies." The remaining portion of the report is devoted to a brief summary of the Hindu method of eclipse prediction, a chapter on future total solar eclipses in India, with twelve charts of tracts of past and future solar eclipses, and lastly to the answers to a series of questions concerning the corona and the attendant phenomena.

The volume, which is published under the direction of Major-General C. Strahan, R.E., the Surveyor-General of India, is very well illustrated, and should serve as a useful guide and source of valuable information for future eclipse expeditions.

NOVEMBER METEORS.—The *Harvard College Circular* (No. 35), which has just come to hand, describes in a brief manner an account of the preparations for observing the Leonid shower in America, and the preliminary results obtained. It will be remembered that last year Prof. E. C. Pickering organised a large staff of observers not only to make visual observations, but to record, if possible, their trails and spectra photographically. This year the organisation was even more complete, and stations were selected all round the earth in order that the number of visible meteors might be counted during the entire period that the earth passed through the swarm. The present *Circular* deals with the observations made at Cambridge (U.S.A.) and Providence, the reports from other stations not having yet arrived.

At the former town the night of the 13th was cloudy, but the 14th was clear. Thirty persons at the observatory recorded 800 meteors, not including duplicates, the maximum number having occurred at 3 o'clock in the morning, when 61 meteors east of the meridian were counted in thirty minutes. No less than 227 trails of eighty different meteors within 30° of the radiant were charted. At Providence the vicinity of the radiant point was continuously watched by at least ten observers, and 400 meteors were seen. Prof. Pickering chose this station (which is forty miles south of Cambridge) for visual determinations of parallax.

As regards the success of photography for this work, the results obtained seem very promising. Ninety-six photographs were taken at Cambridge with the Draper telescopes, and eleven with smaller instruments. Not only were photographic doublets employed, but prisms were utilised; but these, unfortunately, failed to give any record. By means of the doublets thirty-one trails of eight different meteors were photographed, three of which appeared on one plate. Four meteors were photographed at both stations, so that the parallax can be obtained photographically. A preliminary determination of the radiant point